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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
SATOSHI NIYAMA ET AL : GROUP ART UNIT: 2871
SERIAL NO: 10/028,787 :
FILED: DECEMBER 28, 2001 : EXAMINER: THOI V. DUONG
FOR: LIQUID CRYSTAL OPTICAL :
ELEMENT AND TEST METHOD FOR ITS
BOUNDARY LAYER

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

I am the attorney or agent of record.


Respectfully Submitted,

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ATTACHMENT TO PRE-APPEAL BRIEF REQUEST FOR REVIEW

Claims 1, 2, 5, 6, 11-23 and 27-30 are pending.

Applicants respectfully request review of the following issues.

- 1) Claims 1, 2, 11-14, 16-18 and 27 stand rejected under 35 U.S.C. § 103(a) over West et al in view of Unno et al. This rejection is traversed.
- 2) Claims 5, 19, 21-23, 28 and 30 stand rejected under 35 U.S.C. § 103(a) over West et al in view of Unno et al and Konuma et al. This rejection is traversed.
- 3) Claim 6 stands rejected under 35 U.S.C. § 103(a) over West et al in view of Unno et al and Konuma et al and further in view of Gotoh et al. This rejection is traversed.
- 4) Claim 15 stands rejected under 35 U.S.C. § 103(a) over West et al in view of Unno et al and Khan et al. This rejection is traversed.
- 5) Claim 20 stands rejected under 35 U.S.C. § 103(a) over West et al in view of Unno et al and Konuma et al and further in view of Khan et al. This rejection is traversed.

The present invention as set forth in **Claim 1** relates to a chiral nematic liquid crystal optical element, comprising:

- a pair of substrates with transparent electrodes; and
- a liquid crystal layer having a memory property interposed between the substrates;
- a first resin layer which is provided on one of the transparent electrodes,
- said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;
- a second resin layer which is a resin layer selected from the group consisting of a surface layer which has not been subjected to an alignment treatment by rubbing, a vertical alignment layer or a horizontal alignment layer, said second resin layer being provided between the liquid crystal layer and the other of the transparent electrodes;**
- wherein said liquid crystal layer exhibits a planar state and a focal conic state;

wherein the second resin layer has a surface hardness of B or less in a pencil hardness test.

Claim 5 relates to a chiral nematic liquid crystal optical element, comprising:
a pair of substrates with transparent electrodes; and
a liquid crystal layer having a memory property interposed between the substrates;
a metal-oxide layer provided on at least one of the transparent electrodes;
a first resin layer which is provided on one of the transparent electrodes,
said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;

a second resin layer which is a resin layer selected from the group consisting of a surface layer which has not been subjected to an alignment treatment by rubbing, a vertical alignment layer or a horizontal alignment layer, said second resin layer being provided between the liquid crystal layer and the other of the transparent electrodes;

wherein said liquid crystal layer exhibits a planar state and a focal conic state;

wherein the second resin layer has a surface hardness of B or less in terms of a pencil hardness test.

Claims 29 and 30 relate to the liquid crystal optical element according to claim 1 or 5, respectively 1, wherein said second resin layer **consists of a resin**.

As acknowledged by the Examiner, West et al fail to disclose the second resin layer having a surface hardness of B or less in a pencil hardness test as claimed in Claims 1 and 5 of the present invention. See Office Action of May 2, 2006, at page 4, 1st full paragraph and page 7, 1st full paragraph.

In addition, the Examiner has acknowledged that West et al fail to disclose the metal oxide layer on at least one the transparent electrodes as set forth in Claim 5 of the present invention.

Unno et al disclose a liquid crystal device of the photo-writing type (space light modulator-SLM, col. 1, lines 11-14) having a ferroelectric liquid crystal (chiral smectic liquid crystal) (col. 1, lines 39 and 53). This type of display is substantially different from the multistable chiral nematic display of West et al (col. 6, lines 49-50). Since the materials used are substantially different and since a smectic LC exhibits a layer structure while a nematic LC does not exhibit such layer structure, there is no motivation to combine Unno et al with West et al.

Further, the Examiner has referred to column 6, lines 16-34 of Unno et al to show a resin layer having the claimed pencil hardness. However, the layer of Unno et al is a charge transport layer. In addition to a resin, this layer also contains a charge transporting substance. However, this is different from the second resin layer of Claims 1 and 5 which is simply a resin layer.

Including a charge transport layer in the multistable chiral nematic display of West et al is not meaningful as the presence of a charge transport material makes the layer conducting which could create defects in the LC of West et al. **If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification** (*In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

Further, in **Claims 29 and 30**, the second resin layer consists of a resin and thus explicitly excludes additional materials such as a charge transport material.

The combination with Konuma et al does not result in a chiral nematic liquid crystal optical element as claimed in Claim 5 because the proposed combination lacks one rubbed vertical alignment layer (first resin layer) combined with a second resin layer which is a resin layer selected from the group consisting of a surface layer which has not been subjected to an alignment treatment by rubbing, a vertical alignment layer or a horizontal alignment layer,

said second resin layer being provided between the liquid crystal layer and the other of the transparent electrodes.

Gotoh et al has been cited to show a driving voltage as in Claim 6. However, the combination of West et al, Unno et al, Konuma et al and Gotoh et al **does not result** in the claimed invention because the proposed combination lacks one rubbed vertical alignment layer (first resin layer) combined with a second resin layer which is a resin layer selected from the group consisting of a surface layer which has not been subjected to an alignment treatment by rubbing, a vertical alignment layer or a horizontal alignment layer, said second resin layer being provided between the liquid crystal layer and the other of the transparent electrodes. Thus, not prima facie case of obviousness has been established.

Khan et al disclose a liquid crystal device having a chiral nematic liquid crystal (Khan et al, abstract). The Examiner has cited the reference to show insulating layers as in Claim 20. However, Khan et al do not cure the defects of West et al, Unno et al and Konuma et al because there is no alignment as claimed: one rubbed vertical alignment layer (first resin layer) combined with a second resin layer which is a resin layer selected from the group consisting of a surface layer which has not been subjected to an alignment treatment by rubbing, a vertical alignment layer or a horizontal alignment layer, said second resin layer being provided between the liquid crystal layer and the other of the transparent electrodes. Thus, not prima facie case of obviousness has been established.

Thus, even a combination of West et al, Unno et al and Konuma et al and Khan et al does not result in the claimed invention.

Withdrawal of all rejections of record is respectfully requested.